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*Annual Meeting of the Board of  
Governors  
of the  
International Association for Prevention  
of Blindness*

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PARIS, FRANCE, NOVEMBER 14, 1931

THE INTERNATIONAL ASSOCIATION  
FOR PREVENTION OF BLINDNESS  
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## THE INTERNATIONAL ASSOCIATION FOR PREVENTION OF BLINDNESS

### General Assembly Held in Paris on November 14, 1931

The General Assembly of the International Association for Prevention of Blindness was held in Paris, 2 Avenue Vélasquez, on Saturday, November 14, at 2 P. M., Prof. de Lapersonne being in the chair. This meeting coincided with the annual meeting of the French Committee for the Prevention of Blindness.\*

*League of Nations:* Dr. Pantaleoni, member of the Health Section of the League of Nations.

*Argentina:* Dr. Henrique B. Demaria.

*Belgium:* Prof. van Duyse, representing the Belgian Red Cross; Prof. Henri Coppez, Dr. Van der Straeten, Dr. M. Danis, Dr. L. Coopez.

*China:* Dr. Lossouarn, president of the Chinese League for the Prevention of Blindness.

*France:* Prof. de Lapersonne, president of the International Association; M. Lévêque, representing the Minister of Public Health; M. Pigot, representing the Director of Hygiene, Department of Public Health; Mlle. de Teincey, representing H. R. H. the Duchess de Vendôme; Military Intendant Bouscasse, representing General Pau, chairman of the French Red Cross; Countess de Galard, president of the "Association des Dames Françaises" (French Red Cross); Mme. Barbier-Hugo, president of the "Union des Femmes de France" (French Red Cross); Vice-Admiral Amet, secretary-general of the "Union des Femmes de France"; Dr. Morax, Prof. F. Terrien, General Medical Inspector Sieur, vice-president of the French Committee of the International Association; Dr. Coutela, Dr. Monbrun, M. Max Hermant, General Insurance Committee; Dr. Monthus, Dr. J. Rollet, Dr. Roger Nataf (Tunis), Dr. Paul J. Petit, Dr. Chappé, Dr. Bretagne, Dr. Bailliart, Dr. Dantrelle, Dr. Velter, Dr. Jeandelize, Dr. N. Téulière, Dr. M. F. Yves, Dr. R. Sabatier.

*Great Britain:* Dr. MacCallan, Dr. and Mrs. Cridland, Miss E. Young, Dr. A. Churchill.

*Holland:* Prof. van der Hoeve, Dr. Wibaut.

*Hungary:* Prof. E. de Grósz, representing the Hungarian Red Cross.

*Italy:* Prof. Angelucci, Prof. Maggiore.

*Poland:* Dr. Zachert, representing Prof. Szymanski, delegate of the Polish Red Cross.

*Spain:* Dr. Marquez, representing the Spanish Red Cross.

*Switzerland:* Dr. Patry, Dr. F. Humbert, secretary-general of the International Association.

*United States:* Dr. Park Lewis, vice-president of the International Association.

\* Present:

### Report of the President

During the year which has elapsed since our meeting in Brussels, the staff of your Association has endeavoured to fulfill the task and to realize the aims for which it had been created. In spite of the difficulties inseparable from a world-wide economic crisis, our work has made good progress and I can state before you today that it has widely enlarged its scope and fully justified your expectations and your hopes. May I express my warmest thanks for the devoted support and the generous help you have constantly given us and which are the basis of the achievements we are justly proud of?

In agreement with the wishes of those who have created our Association and with the program we had laid before you last year in Brussels, the staff has worked along three main lines: the creation of national committees in the various countries affiliated with the Association; the collection of the necessary funds to carry on our work; finally, a project for public education, as intensive and widespread as our means would permit, on behalf of the preservation of sight.

Straight after our return from Brussels and before the end of last year, we were able to establish a French National Committee whose composition was immediately made known to you. I wish to emphasize the fact that we have applied for and obtained the very cordial co-operation not only of representatives of the chief ophthalmological societies in France, but also of members of the Government, of the Académie Française, of the University, of Insurance Societies, of the Red Cross, etc. I believe this eclectic and comprehensive constituency is that best suited to our Association and that our connections can never be too wide. In our educational campaign we appeal to all representatives of progressive thought and action. My eminent colleagues will speak on behalf of the committees they have created in their respective countries; I shall be content to mention here Argentina, Belgium, Brazil, France, Germany, Hungary, Italy, Mexico, Poland, Portugal and Spain. I beg to express to the representatives of these countries the congratulations of this Assembly for the task they have assumed in spite of critical circumstances.

As regards finances, we soon gave up the plan according to which a world-wide appeal would be issued on behalf of our Association.

To start with, we lacked the necessary resources for such a vast undertaking. Besides, we realized that from the economic as well as from the educational point of view, methods must be adapted to the conditions prevailing in each country. What is appropriate on this side of the frontier is no longer so on the other. We intend, therefore, to act as far as possible through the intermediary of national committees.

As for this country, I must thank first of all the Minister of Public Health who has renewed and even gone beyond the generous help he had granted us last year. This sanction on the part of public bodies is an inestimable encouragement to persevere in our efforts. The General Insurance Committee has brought a very substantial contribution, not only to our work, as I shall presently mention, but also to our budget. Either individually, or through the intermediary of their organizations, my colleagues, the French ophthalmologists, have made a really enthusiastic reply to our appeal on behalf of the Association. Let them please find here the expression of my warmest thanks. Finally the National Society for the Prevention of Blindness in America has constantly given us its powerful support, duplicating all the subscriptions we have collected in Europe and securing recently the largest donation which has so far been granted for our work. I hope our eminent vice-president, Dr. Park Lewis, whom we are happy to welcome most cordially, will kindly bear to the National Society and its generous subscribers the earnest expression of our gratitude. They stand once more for the fine American traditions of generosity and practical achievement.

If we now turn to the direct educational efforts on behalf of sight preservation, the results we have obtained are also most encouraging, and here again the collaboration which has spontaneously come to us is a proof of the vivid interest raised by our work. Among the publications directly or indirectly inspired by us I shall mention the following: the accounts of our meeting at Brussels, the French edition of which has appeared in the *Archives d'Ophthalmologie*, while the English edition has been published in the United States, by the National Society. Two papers by Dr. Cridland on the origin and aims of our Association have appeared in the two biggest medical journals of Great Britain—the *British*



*Medical Journal*, and the *Lancet*. Numerous propaganda articles have been published in the American press and in the remarkable journal, recently created by the National Society for the Prevention of Blindness, entitled the *Sight-Saving Review*. Finally, M. Louis Forest, who is as well known by his fame as a journalist as by his brilliant and devoted support to all charitable endeavours, has dedicated a special number of *L'Animateur des Temps Nouveaux* to our propaganda. This pamphlet will be distributed by the thousands of copies throughout the country and especially among school children; it will contribute most efficiently to make our ideas and objects more widely known among the public.

We have also sent documents and a program of activities to the Indian Red Cross, and the secretary-general of this society has informed us that prevention of blindness would be included in the activities of the Junior Red Cross in India. The latter numbers, according to recent statistics, 85,000 members. When it is realized to what extent blindness and eye disease are prevalent in India, the possibilities for education which are available in that country will be fully appreciated.

The documents we have sent to the South African National Council for the Blind, through the intermediary of the Red Cross, have also led to satisfactory results. This Council has adopted the following resolution: "That in view of the fact that the compulsory use of a 1 per cent solution of silver nitrate in the eyes of the newborn child, immediately after birth, has proved so effective in the United States, Canada and Scotland in the prevention of blindness, this National Council for the Blind urges that the use of this prophylactic be made similarly compulsory in this country." This resolution has been forwarded to all municipal and provincial public health authorities in the Union as well as to the Government departments concerned.

We express our most sincere thanks to Madame Barbier-Hugo, President of the Union of French Women (French Red Cross), who has kindly forwarded to us the telling results obtained in the dispensaries created by this powerful society, especially in southern Tunisia. May I remind you that the three branches of the French Red Cross are doing highly valuable work as regards sight preservation throughout Northern Africa?

In France our efforts have had two main objects in view: the creation of sight-saving classes and the adoption of safety devices in industries. Accompanied by our secretary-general, I have had an opportunity of discussing the latter problem with eminent representatives of French industry at the headquarters of the General Insurance Committee. Presently, Dr. Coutela, secretary-general of the French Committee and M. Max Hermant, secretary-general of the Insurance Committee, will make a few suggestions on this subject.

We have given particular attention to the creation of sight-saving classes. Thanks to the kind support of M. Renard, prefect of the Seine, we have been able to carry out a vast inquiry and to examine the eyes of several hundred children. We have every reason to hope that special classes for this most interesting group of children will soon be established in Paris.

Our associate secretary-general, Dr. A. Churchill, went to London to visit sight-saving classes, and we have ordered, for demonstration purposes, exhibits of the special material used in these classes. Moreover, your secretary-general, Dr. Humbert, presented to the Child Welfare Committee of the League of Nations a report on the education of blind and partially blind children.

I cannot leave this subject without expressing my thanks to Dr. N. Bishop Harman, the illustrious creator of sight-saving classes, who has kindly helped us with our work and whose name we shall ask you to inscribe among our Honorary Members. The growth of these classes in Great Britain and in the United States is the most certain tribute paid to his work and we hope that, thanks to our efforts, continental Europe will soon follow in this respect the example of its predecessors.

Lastly, may I mention the poster we have exhibited in the Permanent Museum of the Colonial Exhibition. You all know what immense field is open to our activities in these vast overseas dominions where eye disease is answerable for millions of victims. Our poster will remind all visitors that they have responsibilities as well as duties as regards these unfortunate people.

Such are the main facts we intended to bring out in the account of our Association during the past year. We should be happy to obtain your approval for the lines of action we have adopted.

A sorrowful duty lies before me, that of evoking before you the memory of Prof. Fuchs, one of the most illustrious names in ophthalmology. In the early days of our Association, he granted us his patronage and the prestige of his world-wide fame has no doubt largely contributed to the welcome we have received on all sides. The International Association bows with earnest and respectful gratitude before this great name which will always be to us an example and a token of hope in the future.

### **Report of the Secretary-General**

Administrative questions are in the first instance concerned with the budget. The accounts are at the disposal of members of the Executive Committee who wish to consult them; a final account has not been distributed as the fiscal year is not yet over. I shall be content to point out, in order to show the increasing prosperity of the Association, that after closing the year with a transfer to the following budget of 12,632.20 francs we had on the date of October 31, 1931, a credit balance of 78,133.22 francs.

This fine result is due to the support already mentioned in the President's address; special mention must be made of a subsidy by the French Ministry of Public Health, of individual subscriptions collected in France and more especially of the very generous help we have continued to receive from the United States of America, either through direct contributions from individual members, through subsidies from the National Society for the Prevention of Blindness, or through very important donations secured over there by our friends.

The resources of the Association must serve to extend, at an ever-increasing rate, our propaganda and activities. Our work may be summarized under three main headings:

(1) Campaign to bring about a decline in industrial eye accidents.

(2) Endeavors to protect the eyes of children, special emphasis being laid on the creation of sight-saving classes for the education of children with defective vision.

(3) The extremely important task, in overseas countries and



in the colonies, of preventing blindness by a social campaign against infectious diseases.

In providing for a substantial transfer of our actual resources to the budget of 1932, we have had in view, first of all, the uninterrupted continuation of our activities, in spite of the possible effects of the present crisis on our resources.

Next we must endeavor, as soon as possible, to establish a permanent secretariat of the Association on an entirely independent and autonomous basis; we hope to be able to do this by the beginning of next year. However we may value the help the Association has received from the League of Red Cross Societies during the last two years, a period which might be termed its trial heat, it is obvious that a restricted activity is a vicious circle from which the Association must escape in order to take on a wider development.

As soon as a permanent staff is able to deal exclusively with educational projects and publicity, in order to make our work more widely known, we shall enlist a larger number of individual members; we hope we may also, at a later date, receive some support from the National Committees which we have helped to create. I would strongly emphasize the fact that it is not only among ophthalmologists that we must look for help, since they already give us their time, their scientific knowledge and their collaboration; we must, on the contrary, endeavor as far as possible to interest in their work which is also ours, the general public, philanthropists, industrial circles, whether employers or employees, all those who look after child welfare at home and in the school. Experience in America has shown that it is only when all classes of the public have really understood the reasons and the immediate and practical importance of our work, that an action of really wide scope can be undertaken, and that widespread education must continue until the day, which is yet remote, when an irreducible minimum of blindness is reached. Prolonged preventive action must yet take place before we can expect to reach this point.

I hope you will approve the material and administrative organization of the secretariat which enables us to work on these lines under the ever active influence of our President, without whom we would be helpless and to whom I would like to pay due homage.

### The National Committees

THE PRESIDENT reminded the Assembly that National Committees had been established in the following countries: Argentina, Belgium, Brazil, France, Germany, Hungary, Italy, Mexico, Portugal and Spain. He requested representatives from these various countries, present at the meeting, to explain briefly to the Assembly the constitution of their respective committees.

In the absence of representatives from Argentina, Brazil and Germany, Dr. A. Churchill, associate secretary-general, outlined the composition of the Committees created in these countries.

PROF. VAN DUYSE (Belgium) stated that the Belgian Committee, which has just been created, includes not only ophthalmologists but representatives of various associations such as the Belgian League against Tuberculosis, the National Association for the Blind, and the National Child Welfare Organization. The Belgian Committee held its first meeting at the headquarters of the Belgian Red Cross; this society has kindly placed at the Committee's disposal its offices and the services of its staff. The Committee has decided to undertake a wide educational campaign through the press, the distribution of pamphlets, lectures, etc. Finally they have applied for the patronage of Her Majesty the Queen of the Belgians whose father had been a distinguished ophthalmologist. The Belgian Committee looks to the future with optimism and expects to obtain results in accordance with the Association's ideals.

DR. CRIDLAND (Great Britain) mentioned that the formation of a British Committee was making good progress; however, he could not go into details as plans for a bigger organization than a committee are now under consideration.

This has not been considered an appropriate time for issuing a financial appeal on behalf of the Association, but Dr. Cridland was happy to report that, thanks to the generosity of a colleague who wished to remain anonymous (although his name is as honored in France as in England), he was able to bring to the Association a contribution of 6,000 francs. He hoped he would soon be able to announce the constitution and program of a British Committee.

PROF. MARQUEZ (Spain) was sorry to say the Spanish Committee was composed entirely of ophthalmologists, but he hoped it

would eventually include other people as well. He took the opportunity of inviting his colleagues to the International Ophthalmological Congress to be held in Madrid in 1933.

DR. COUTELA read the list of the French Committee, of which he is secretary-general.

PROF. VAN DER HOEVE (Netherlands) apologized for not having established a National Committee; prevailing economic conditions were his excuse. He hoped that within a few months the Dutch Committee would be formed.

PROF. DE GRÓSZ (Hungary) announced the formation of a Hungarian Committee which had requested him to present its respectful homage to the President and Secretary-General of the Association. The Hungarian Committee intended to carry on its task in spite of the serious difficulties of the present situation in Hungary.

PROF. MAGGIORE (Italy) mentioned the creation of a National Italian Committee which included eminent personalities representing the Government, the teaching profession, the Red Cross, etc. This Committee has received the co-operation of the National Insurance fund which already exerts a powerful influence on behalf of social assistance and preventive hygiene.

DR. ZACHERT (Poland) stated that a section dedicated to social ophthalmology and the campaign against trachoma had been created in the Ophthalmological Society. This section acts provisionally as a National Committee for the Prevention of Blindness; its president is Prof. Szymanski.

For propaganda purposes this section has published a quarterly bulletin which includes statistics on blindness and an account of preventive measures adopted in Poland.

THE PRESIDENT reminded the Assembly that they must, in agreement with the statutes, re-elect the staff of the Association which was constituted as follows:

President: Prof. de Lapersonne (France)

Vice-president: Dr. Park Lewis

Secretary-general: Dr. F. Humbert (Switzerland)

Treasurer-general: M. Demachy

Correspondent for the United States: L. H. Carris

Associate secretary-general: Dr. A. Churchill.

PROF. VAN DUYSE (Belgium) believed he was interpreting the feeling of his colleagues in asking that this question should not be put to the vote, but that the present staff should be re-elected by acclamations. In proposing this re-election he wished to express in the name of the Assembly his admiration for the manner in which members of the staff had accomplished their task.

This resolution was adopted by acclamations.

THE PRESIDENT thanked the Assembly for this token of confidence and expressed his faith in the future of the Association.

He proposed to his colleagues to re-elect the Executive Committee which was constituted as follows:

Dr. Roffo (Argentina), Prof. van Duyse (Belgium), Prof. von Szily (Germany), Dr. Cridland (Great Britain), Prof. Trantas (Greece), Prof. van der Hoeve (Holland), Prof. de Grósz (Hungary), Prof. Maggiore (Italy), Dr. Shinobu Ishihara (Japan), Dr. Villarreal (Mexico), Prof. Szymanski (Poland).

This was adopted by acclamations.

THE PRESIDENT declared that administrative questions were thus settled. He added that one of the most interesting subjects on the program of the Association was the prevention of industrial eye accidents. Dr. Coutela had kindly prepared a report on this special subject and on the modification to be introduced in the Act of 1898 to promote the prevention of industrial accidents.

## Present Legislation and Protective Measures Against Eye Hazards in Industry

DR. COUTELA

Among the problems dealt with by our Association none is more timely or more important than that of industrial accidents. The fact that this subject is up-to-date can be readily gathered from the work of the League of Nations, of the recent Congress on Forensic Medicine (August 1931), of the yet more recent Congress on Technical Education (September 1931), and, above all, it would seem, from parliamentary discussions, especially in France, both at the Chamber of Deputies (report by Gros), and at the Senate (report by Dr. Chauveau).

Its importance has long been demonstrated by the work of the American National Society, and since then, in 1929 at Amsterdam, in 1930 at Brussels by the addresses of Dr. Park Lewis, Mr. Lewis H. Carris, Dr. Cridland (Wolverhampton), and Prof. von Szily (Munster), as well as by the report of Prof. de Lapersonne on the results of an inquiry undertaken among ophthalmologists at the request of the General Insurance Committee.

In fact, the number of industrial eye accidents is very high: according to the National Safety Council's estimates there are in the United States 200,000 eye wounds annually; mathematical minds have reckoned that this is equivalent to one eye wound every three minutes, by day and night. Moreover, eye accidents lead to serious consequences: in Paris, compensation for loss of eyes constitutes 40 per cent of the total amount awarded for permanent injuries. It is far from my intention to involve myself in questions of jurisprudence, yet it seems to me that a few modifications in the present legislation (French Act of April, 1898) would improve the sufferers' condition; this would therefore concern justly the movement for the prevention of blindness.

*Delay Before an Indemnity Is Granted.*—Any person suffering from an industrial accident receives, while unfit for work, an indemnity; in France and most other countries, this indemnity is equal to half the salary, but it is only due if work is interrupted for more than four days.

In other cases—known as minor injuries—the sufferer receives no indemnity.



Hurstel, on the basis of 1,154 wounds of the eye, points out that 81 per cent of cases come within the category of minor injuries; that is to say, the great majority of eye accidents do not as a rule entitle the sufferer to any indemnity for cessation of work.

This being granted, what really happens? The wounded workman, knowing he gets no indemnity for such small trouble, thinks twice before interrupting his work. Sometimes he applies to one of his comrades for relief: a foreman removes or tries to remove the foreign body, and without going as far as recalling that cases of syphilis have not infrequently been acquired in this way, we must emphasize the fact that such incompetent treatment may be not only inefficient but harmful.

Therefore, in most cases—and this becomes a rule if the workman is paid by the hour or according to the amount of work done—he does not interrupt his work. The pain becomes weaker; the foreign body becomes incrustated with each movement of the eyelids; the workman rubs his eyes with fingers which are always septic; the foreign body sinks deeper, the cornea becomes infected and it is only a few days later that the workman is obliged to interrupt his work. The foreign body has gone deeper; the accidental and even the surgical scar will be more marked; the temporary disablement will be prolonged and may even be followed by permanent disablement.

This wound, however, if treated at once, would have quickly healed with no consequent disablement. Who gains from this procedure? No one! The interests of employers and employees are in this case identical.

What justification is there for granting no indemnity for minor injuries? Two measures are put forward in Dr. Chauveau's report: abuse on the part of workmen; abuse on the part of doctors.

Abuse on the part of doctors? It cannot be denied that abuses have occurred. The medical profession, like any other, has its black sheep, but I don't see any reason for throwing suspicion on the whole medical corps, while most of us (exceptions only are mentioned and with what wide publicity!) carry on our work with a conscientiousness one would like to find in all other professions.

Abuse on the part of workmen? This would be shown by the

fact revealed in statistics, that minor injuries occur mostly on Saturday morning. I don't know whether statistics have been drawn up for foreign bodies of the cornea, but I have been able to examine statistics of accidents which had occurred during a year in the factories of a large railway company: the rate goes on increasing from Monday to Thursday—decreasing from Thursday to Saturday. The inquiry made by Prof. de Lapersonne, at the request of the General Insurance Committee, cites the statistics of Dejean: the maximum number of eye injuries occur on Friday (20 per cent), then on Thursday (18 per cent); Saturday, as well as Monday and Wednesday, show a rate of 16 per cent.

In fact I do not think—and I am interpreting here the feeling of all oculists—that foreign bodies in the cornea, the commonest accident in our practice, is often simulated. There may, of course, be exceptions to this rule; but why should the bulk of honest workers be made to bear the consequences of the objectionable behavior of a very small minority?

No argument, no suspicion, which I consider illegitimate and unfounded, can justify, as regards eye injuries, the present delay before an indemnity is paid.

What remedy is there to this state of affairs?

Could a kind of premium for immediate treatment be awarded to the workman who has his eyes attended to at once? This premium would serve to compensate the workman who is paid by the hour or by the amount of work done.

Could the delay before an indemnity is awarded be suppressed purely and simply? This solution has been adopted in the bill voted by the Chamber of Deputies, on condition that the half salary corresponding to a holiday would not be paid when the latter happens to occur on the morrow of the accident.

Could the delay be avoided by considering the disablement to be partial and temporary instead of absolute?

We do not wish to choose between these three solutions, but one of them will have to be adopted; it would enable the sufferer to be treated with very little delay and so avoid permanent disablement.

All this obviously and primarily comes within the scope of our Association.

*Temporary Disablement.*—All oculists are unanimous in acknowl-

edging that minor eye injuries do not justify temporary disability compensation such as it is actually understood by most legislators and which amounts in fact to complete disability.

Ask the injured men who come every morning for their dressing what they do during the day. They invariably reply, if they trust you, that at home they do small jobs. Some of them work for themselves, others, even, who are cleverer, work for another employer; this is obviously an abuse which could be stopped, I think, by the admission of partial temporary disablement. The latter, however, is not accepted by the legislation.

I know, of course, that certain employers, certain insurance companies, give the workman a few hours to go for treatment and come back to work; but this is not the rule and no workman is entitled to it. And even when employers show this degree of kindness, how rarely, while granting this permission, do they award any compensation for this compulsory interruption of work, if the workman is paid by the hour or according to the work done?

Partial temporary disability would enable the workman to be treated with a minimum interruption of work. Moreover, this partial disability might apply not only to minor injuries, but to more serious injuries as well; indeed, many workmen, suffering from eye injuries which may even be severe, might, once their wound is dressed, be employed in some kind of capacity if not in their ordinary work.

There again, employer and employees would be benefited: the functional loss would be diminished, a result which our Association places above all others.

*Re-examination Interval.*—In France and in many other countries this interval legally amounts to three years, and is accepted by both employers and workmen. As regards eye accidents, such a period is obviously too short. There are many examples of this.

Shall I mention the hospital colleague of mine whom I treated for a severe ulcer with hypopyon: the sight of this eye was practically nil when the lesion had become arrested; after six years of supervision and careful attention he had, when wearing glasses, normal vision in the diseased eye. If one had been dealing with an industrial accident, what a saving would have resulted for the insurance company from such an outcome, which is not exceptional.

Examples to the contrary are unfortunately much more frequent, and we might all remember a large number of them. Shall I mention sympathetic ophthalmia, an occurrence which, although it is becoming rarer every day, is extremely serious since it may end in blindness, and which may recur at distant intervals: 4 years, 15 years and even 45 years! In 1928 I myself, with Dr. Mathieu, attended a brave retired colonel who had, on one side, an atrophic eye and, on the other, an intensive flare-up of iridochoroiditis; both eyes were red and painful. As a matter of principle I removed the atrophic eye and found in it a round fragment of glass. The colonel then remembered that, while he was at St. Cyr, he had placed a thermometer above a spirit lamp in order to warm it up and that it had burst; this had happened 52 years ago! Was this a case of sympathetic ophthalmia? I don't know, but the other eye subsequently improved. And I do not mention intra-ocular foreign bodies which in the long run give rise to siderosis!

I am aware that a recent French act admits of re-examination beyond the legal period of three years, but only in cases which have progressed to the point of blindness! I realize the legal and financial difficulties which would result, for employers, from re-examination with no specified interval; but I am obliged to point out its possibility since it has been realized in certain countries: Norway, the Netherlands, etc.

In Germany, "in his anxiety to arrest the tendency of working classes towards socialism," it was the Iron Chancellor who had the act of 1884 passed: whatever the date of the accident, a re-examination is always possible, subject to various formalities on which I need not insist here. It is not my concern to point out a solution, but the International Association for Prevention of Blindness cannot set aside this question of re-examination: the sufferer thereby gets an opportunity of being more easily supervised and treated, which is the important point.

Such are the chief modifications which I think necessary to introduce into the French Act of 1898 and into similar legislation in other countries. These modifications are indispensable to the realization of our aims.

A report on the prevention of eye troubles as the result of industrial accidents would not be complete if two allied but very im-

portant questions were left out: I mean examination on engaging workers and preventive measures against accidents.

*Preliminary Examination.*—Actually a preliminary examination is regularly applied only to apprentices in technical schools; it is on this score that it has attracted the attention of the Congress on Technical Education.

For workmen, this examination appears to be the rule in America; in Europe it is quite exceptional. However, in France, it is resorted to by some industries and especially by railway companies, not only as regards so-called security posts, but also for the staff employed in workshops. The object of these examinations is not by any means to look out for defects among workmen in order to shut them out of factories, nor to interfere later with the indemnity due for an industrial accident. Their real object is twofold: to improve industrial output and to verify medical diagnosis.

(a) *Industrial Output.*—This object meets the interest of employer and employee alike. A long step in prevention is already taken in pointing out to the workmen the defects which may make it difficult for him to carry out a given kind of work while he is perfectly able to perform work of another kind. Several years ago (1926) Prof. Truc, in studying ocular hygiene in its relationship to work, prepared a graphic picture of ordinary occupations classed according to the eye demand and to the minimum visual acuity in each eye required at the position.

I cannot insist further on these considerations, the importance of which is sufficiently obvious.

(b) *Medical Diagnosis.*—How many workmen (and others besides workmen) are in reality patients who ignore their condition? How often is a refraction defect unrecognized? According to statistics, 50 per cent of workmen employed in factories have defective eyesight (Lewis H. Carris). Correction would lead in the United States to an 11 to 13 per cent gain in production.

How often is a pathological defect ignored or untreated? I shall merely mention the frequency of chronic dacryocystitis which transforms the slight trauma caused by the common foreign body of the cornea into a severe lesion, susceptible of involving loss of eye and considerable disablement.

The fundamental interests of employers and workmen are here



identical. In America, as well as in France, workmen were at first hostile to these examinations, but wherever they have been applied they have been so highly useful, they have enabled one to detect so much unrecognized disease, that their scope has gradually become wider. The staff in certain firms has at last realized that one may thereby detect lesions which might have become worse and which have been checked by appropriate treatment at the right time. One might in fact suggest that these examinations be carried out in agreement with workmen's organizations.

*The Prevention of Accidents.*—"To indemnify the victim of an industrial accident or members of his family, to compensate as far as possible for harmful consequences, constitutes undoubtedly an act of justice which is greatly appreciated by all those interested; to prevent and avoid accidents would be even better." These are the words of Senator Chauveau in his report on the modifications to be introduced in the Act of 1898. He dedicates a highly important and interesting chapter to the prevention of accidents; but I am not under the impression that it has been taken into account in the text of the act proposed in conclusion.

In fact preventive measures, it seems to me, cannot be made legally compulsory.

We are dealing here above all with a psychological problem, both as regards workers or employers. When the day comes when workmen realize the importance of not exposing themselves needlessly to risks, when employers realize that it is in their interest to apply preventive measures (prudence on the one hand, foresight on the other), great progress will have been made and accidents will be reduced to unforeseen risks.

The prevention of accidents must have two aims in view: (a) to prevent the accident from happening; (b) to limit its consequences once it has occurred.

(a) *To Prevent Accidents from Happening.*—I cannot enter here into all the details of this chapter—particularly as, when speaking of details, I can add that each one of them is of outstanding importance.

Plant arrangement: spacing, free access to entrance and exit doors, wide enough passages, lighting; 24 per cent of eye accidents seem to be due to defective lighting.

The installation of machines: their trial, their constant supervision, the setting and supervision of the safety devices which surround these machines as well as the attached leather straps; no detail can be left aside.

Forty-four per cent of eye accidents result from the use of hand tools, worn-out tools, defective or inferior tools; economies in the purchase or upkeep of these tools do not compensate for the resulting risks.

However, the employer or his substitutes cannot be present everywhere. In 1925 the Mutual Insurance Syndical Fund of French Ironworks instituted premiums for foremen in whose teams the rate of frequency and severity of accidents had been reduced by 10 per cent from one year to the next. In 1925, 110,800 francs had been distributed; in 1926, 253,000 francs; and in 1927, 383,000 francs. These figures in themselves fully justify these premiums.

The Insurance Company's Central Office of Prevention has realized vast plans for the application of preventive methods. I cannot go into details, but it is enough to mention, among other things, the creation of a body of specialized engineers who go to insured persons, visit factories and supply heads of industries with all necessary information. At the request of the Central Office, the office "Veritas" has organized a special section for the prevention of industrial accidents. This most remarkable organization is due to the initiative and endeavors of M. Max Hermant.

One might, as is done in America, provide for the creation of a staff of visitors composed of former employees, victims of industrial accidents; they would visit factories and talk to workmen; the latter would treat them like comrades and not like inspectors representing the employer, the insurance company or the state.

This really active method of practical education leads me to consider the various methods used in factories to gain the workmen's attention: notice handed to the workmen when he enters the factory and periodically renewed; exhibition in the factories, not only of posters dealing with safety, but of colored posters placed well in evidence and illustrating, without exaggeration but in the sad reality of their causes and effects, the most common accidents; films along the same lines; salary envelopes attracting attention, etc.

No detail can be left aside and methods cannot be too varied. I have heard of a small quarterly periodical relating, and even mentioning by name, the various accidents which had occurred in the company, in the same way that daily papers mention accidents which occur in the street. A workman takes an interest (this is essentially current news) in these accidents in his own surroundings to which he himself might fall a victim; he comments upon them and one may hope he draws a lesson from these facts, the more so as the repairs undertaken or the precautions to be observed are indicated in each case.

*Precautions to be Observed.*—I have come to an essential part in the prevention of accidents: experience shows every day that this is a most difficult object to realize.

The employer who is responsible must give his workmen the necessary means of protection: protecting goggles, screens of various kinds, hand screens and immovable screens, Cridland's veils, masks of various kinds, etc. Although they could be described at great length, it is obvious that, first of all, the workman must use them. Now, a workman paid by the hour or according to the work done thinks too often that these precautions hinder his work or needlessly complicate it. Therefore he very rarely adopts these safety devices; one has been able to state that he very rapidly acquires a disregard for habitual danger which is all to his credit but which may often amount to rashness. No one believes in the risk one meets every day: "It will be all right again this time" until one fine day "it is not right any longer," but the lesson comes too late.

We are dealing here with a psychological problem, hence the necessity of really educating the workman, an essential and difficult task which calls for all our efforts.

(b) *Once the Accident has Occurred it is Important to Limit its Consequences.*—The necessity of immediate attention is quite obvious and all the oculists who have replied to the questionnaire of Prof. de Lapersonne are unanimous on this point. Early diagnosis and treatment imply a diminution of temporary disablement and, yet more often, a reduction in the rate of permanent disablement. When untreated or badly treated from the start, the most insignificant eye injury may lead to important functional loss.

What usually occurs?

In small industries, it is often a comrade, sometimes the foreman, who spontaneously becomes an improvised nurse, unless the injured man is taken to the next door chemist, who is quite as incompetent as regards useful therapeutics.

In large industries, there is usually a treatment room and a nurse who gives first-aid care. This certainly is better than nothing. All depends on the intelligence of the nurse, who must on no account consider her part as sufficient. The injured man, whoever he is, even if the injury seems insignificant, must be sent as quickly as possible to the doctor, and, as regards his eyes, to a competent eye physician.

In very large factories—this is apparently the rule in America, but it is to be found also in France—first-aid care is given in a small factory post and the workman is sent at once to a central post provided with full-time physicians, one of whom is specialized in the most frequent type of accidents. I might mention the oculist of the Ford factories, who is provided with a remarkable technical outfit; M. Fredet and M. Louis Basy saw him remove, in the space of a few hours, 210 foreign bodies of the cornea. One cannot expect such an organization in small industries, but one might at least insist on the workman's being taken at once to the nearest ophthalmological clinic.

*Occupational Diseases.*—The question of occupational diseases must be considered next.

The Act of October 1919 makes the provisions of the Act of 1898 applicable to these diseases, but only as regards the consequences of lead and mercury. This Act of 1919 has recently been completed by another act (1931) which adds the consequences of intoxication by tetrachlorethane, benzene, phosphorus and X-rays.

However, and this is undoubtedly an advance, article 2 of the Act of 1931 mentions that the nomenclature of occupational diseases may be revised and completed, without having recourse to a new act, by a simple regulation of public administration adopted after consultation with two superior competent commissions.

It will therefore be possible to include, let us hope without delay, in this act, several occupational diseases whose serious consequences to the eyesight may eventually be brought to your notice.

THE PRESIDENT thanked Dr. Coutela for his most interesting report.

M. MAX HERMANT expressed his gratitude to Prof. de Laperonne for the remarkable inquiry he had undertaken on industrial eye accidents, an inquiry which could never have been accomplished without his help. It had enabled many complex problems to be clarified. He added that, as he was daily endeavoring to promote the development of the Insurance Companies' Central Office of Prevention, he attached special importance to these prevention problems.

As regards eye accidents, one was dealing here with a psychological problem; it was extremely difficult and indeed well-nigh impossible to induce workmen to wear goggles. The latter were, in fact, inconvenient and when used by workers employing a mechanical lathe, for instance, they soon became opaque and very uncomfortable. There was room for improvement in that direction. Good results might perhaps be obtained with Dr. Cridland's veils. This method was on trial and if it gave satisfactory results, its use might be recommended.

From the legislative standpoint it was possible that the fact of getting no indemnity during the first four days induced the workman who believed his lesion was insignificant, to neglect treatment. M. Hermant acknowledged that there were few voluntary eye accidents, any man, even when he is but poorly educated, realizing what a delicate thing sight is and what risks the slightest imprudence may involve. However, he considered the delay before an indemnity was awarded to be indispensable, as its omission would lead to endless abuse. As it was impossible, especially during the present economic depression, to lay indefinite charges upon industry, the legislator's aim must obviously be to reserve the largest possible share for severe wounds, rather than to give undue consideration to small accidents.

He acknowledged, on the other hand, that useful results might be obtained through a premium for immediate treatment, as suggested by Dr. Coutela, but he thought that this question should be the object of a separate study and text especially concerning eye accidents. Such a text could hardly be introduced into the bill actually submitted to the Senate, the contents of which were of a



very general scope. When this bill was passed, ophthalmologists and, particularly, the International Association for Prevention of Blindness might ask for a special text relative to the prevention of eye accidents, a category of accidents distinctly apart from others. It would be preferable, indeed, if the necessary measures were the result of private initiative, without having recourse to legislative action.

THE PRESIDENT thanked M. Hermant for his most interesting remarks and added that he would ask the Assembly to adopt a resolution to the effect that eye accidents were different from all other industrial accidents and that it would be preferable either to pass a special act concerning them or to add an article to the General Act.

DR. COUTELA suggested the following formula:

The International Association for Prevention of Blindness, considering the extreme frequency of minor eye accidents, the severity of their consequences in the absence of immediate treatment and the possibility of having them attended to without total temporary disablement, expresses a wish that, as regards wounds of the eyes, modifications be provided for in the present legislation: premium for immediate treatment or partial temporary disablement.

After deliberation it was decided that this resolution would be communicated to the members of the Assembly and, after its adoption, transmitted to public bodies.

## The Value of a Complete Investigation of the Causes of Blindness as a First Step in Prevention

DR. CRIDLAND

I think that all will agree that the first step in the prevention of a disease is a complete knowledge of its cause, and the knowledge of the cause of a disease cannot be said to be complete unless we know how frequent it is. We are already possessed of a knowledge of most of the causes of blindness—I say “most” because from time to time we still meet with rare cases in which we are unable to assign the actual cause of the blindness, although we may well recognize the pathological changes in the eyes themselves which have led to this result.

We have not, however, a very definite knowledge in any country as to the exact frequency with which these causes occur; in other words, we do not accurately know how common this or that cause of blindness is. I am of the opinion that this is necessary, because naturally our first efforts should be directed to those causes which are the most common.

The ideal would be that we should have exact statistics as to the causes and frequency of blindness over the whole world. At present such an ideal would be impossible, but something in this direction can be attempted. The question comes as to how even an attempt can be made.

May I tell you what we are attempting to do in Great Britain?

As perhaps you know we give a pension to each blind person in the United Kingdom, but before that pension can be obtained, it is necessary for the candidate for the pension to produce a certificate, stating that he is “too blind to perform work for which eyesight is essential.” By this means we have the opportunity given us, not only of knowing how many blind persons there are in the country, but at the same time of learning something of the cause of their blindness and its degree.

The Council of British Ophthalmologists has recently drawn up a report on the certification of blind persons, in which attention is drawn to the importance of the fact that the examination of a candidate for a blind pension should be made by an expert in ophthalmology if it is to be of real scientific value.

In many cases of blindness, seen for the first time, it is often a

very difficult matter to say exactly what is the cause of the blindness, and I feel sure that all will agree that the best opinion on this can only be given by an expert, i.e., an ophthalmic surgeon. It is only in this way that a reliable census of the causes of blindness throughout any country can be obtained.

Consider for a moment how valuable it would be in the cause of the prevention of blindness to have an exact knowledge in each country, not only of the number of blind, but of the exact causes of the blindness, and to know at the same time how frequent this or that cause may be. That is, of course, an ideal almost impossible in many countries, but it is something at which to aim.

Already in Glasgow, Scotland, a clinic has been formed, where every blind person is examined independently by two ophthalmic surgeons, who then consult together to compare their opinions. A specified schedule of the causes of blindness with other details has been drawn up, and each case is recorded in accordance with the headings in the schedule. By this means a valuable and consistent record of the causes of blindness in Glasgow and the south-west of Scotland is being obtained.

The question of a uniform schedule of the causes of blindness is now under consideration for England, and it is hoped that soon all cases of blindness will be certified in conformity with that schedule, and so by this means we shall have in due course a complete census of the number of the blind in the country, together with an exact scientific statement as to the cause in each case. We shall then come to know how frequent this or that cause is, and we shall be able to direct our attention, as can be readily understood, to the most common causes first.

What a grand achievement it would be if this Association were in possession of a complete and accurate census of the exact causes of blindness throughout the world, and not only of the causes, but of their frequency.

I put forward the suggestion that at some future date the Association should consider the advisability of drawing up a schedule of the causes of blindness, which might be used uniformly in all countries, for if this were done it would only be a matter of time when our knowledge of the causes of blindness and their frequency throughout the world would be complete. Thus we should have

achieved an important step towards that ideal at which our Association aims, namely, the prevention of blindness.

THE PRESIDENT thanked Dr. Cridland for his excellent address; he asked him to undertake an inquiry as to the best classification of the causes of blindness and to give the necessary instructions to enable one to request the various National Committees to adopt measures in accordance with the speaker's conclusions.

PROF. MARQUEZ (Spain) agreed with Dr. Cridland in insisting on the necessity of a classification of the causes of blindness. He thought these causes must be divided into two groups:

(1) Classification of lesions: Lesions of central nervous system, lesions of ocular globe, lesions of cornea.

(2) Classification of infectious diseases which affect eyesight.

He intended to submit later to his colleagues a synoptical table of the causes of blindness.

THE PRESIDENT thanked Prof. Marquez and hoped he would soon draw up this synoptic table which would be sent to all oculists. In conclusion he added that the meeting would be followed by a lecture which dealt with a subject which was not directly related to the prevention of blindness, but which was most interesting to ophthalmologists. He asked Dr. Park Lewis to give his lecture.

## Cataract in Fresh Water Fish as a Result of Parasitic Invasion of the Crystalline Lens

DR. PARK LEWIS

At a conference held in the city of Washington recently, a report was read by a representative of the department of public health from Mexico City, in which he described the infestation of the native Indians by the filarial worm, *onchocerca caecutiens*. As a result of this infestation an entire village of over seven hundred people had become to a greater or less degree blind. The infections were due to the transmission of the larvae from one to another by means of one of several varieties of gnats of the family *Eusimulium*. An invasion of a parasite involving the eyes of such a large number of people has again called attention to the importance of the parasites in relation to the eyes, and while the subject of the present brief paper has no connection with the filarial worm, the existence of other living parasites in the eyes of living creatures to such an extent as to make the lens almost the normal habitat of certain variety of flukes cannot fail to be of interest to us as ophthalmologists.

While the subject is by no means new, so much new work has been done upon it during the last decade and so direct are the implications that may be drawn from it into the possible pathology of toxins affecting the human lens and producing cataract, that it may justify our bringing it before this distinguished audience for brief consideration today.

In 1831, Prof. von Nordmann made an important discovery. Examining the eyes of fishes he found in the lens the living larvae of trematode worms. They were a low type of flat leaf-like organisms, characterized by openings or suction tubes in the body. They were devoid of sense organs with the possible exception of that of touch. They had eye spots but no eyes and no digestive tract. The oral opening led into a bifurcating blind pouch and nutrition was maintained by osmosis. The amazing fact in his discovery was, that while these entozoa were also found in some cases in other tissues of the eye, they were preponderatingly in excess within the crystalline lens. There were not one or two or a dozen of these living larvae but in some instances they were numbered by the hundreds and so changed the functioning of the lens tissue.



that in a large number of fishes varying degrees of cataract resulted. In some of the fishes the opacities were so opaque that the whiteness was readily distinguished by the casual observer. Occasionally they produced proptosis of the eye and when the infestation of these parasites was extreme, the body was penetrated and the fish was killed. They appeared to have a predilection for the trout, one of the most active of fishes, but they were also found in every other variety of fish living in the brooks, the ponds and rivers.

Von Nordmann described the characteristics of these parasites so accurately that his work is today regarded by zoologists as of basic importance and his name continues to be associated with the *diplostomum volvens*—to which von Nordmann is added as indicating the special species which he described.

Professor von Nordmann was a distinguished ophthalmologist. His discovery, when published in the *Mikroskopische Beiträge der Naturegeschichte* in Berlin, awakened great interest and widespread astonishment. Other investigators verified his observations and the presence of these living larvae in the lens of fishes was found to be of such common occurrence that it soon seemed to be taken for granted that the crystalline lens was the natural habitat of these entozoa in fresh-water fishes, and the subject seemed to have been forgotten.

Steenstrup, writing ten years later and adding other fishes in the lenses of which the diplostomae were found, says that the subject had been so generally accepted that it was no longer of special interest. The presence of the living entozoal larvae in the deepest and least accessible structure within the eye of other living creatures might be considered as merely a biological curiosity, were it not that there have been several cases placed on record by observers of unquestioned accuracy and acknowledged ability in which the progeny of the round worm has been found in the lens of the human eye. Geschiedt (*Zeitschrift für Ophthalmologie*) found in a cataract removed from an aged woman eight specimens of a monostome. These lay in the upper layers of the lens substance and were about one-tenth of a millimeter long. Geschiedt was familiar with parasitic worms and a careful observer and his report is worthy of credence.

In 1883, four larval distomae were found in a congenital cataract of a five-months-old child. These were in the cortex and under the capsule of the lens. The neighborhood was one in which trematodes were abundant. Various theories which may not be considered here have been advanced as to how the eye was reached and the capsule penetrated.

Greeff (*Klinische Monatsblätter für Augenheilkunde*, 1905) demonstrated two dead shrunken trematode larvae in a unilateral cataract from the eye of a dead fisherman. These are the only cases on record.

Kraemer (Graefe and Saemisch: *Handbuch der Augenheilkunde*), in reviewing the possibility of parasitic invasion of the human lens, is disposed to discredit the accuracy of the observations and thinks that *a priori* there would be small probability that the lens of the eye, having no blood-vessels with little metabolic change and enclosed in a thick capsule, would be the primary seat of entozoa.

The subject may not be so lightly dismissed, however, and as Prof. Ward of the University of Illinois, an expert parasitologist, says in relation to these unusual instances: "It is certain that other cases of similar character will be found from time to time in this country where none have yet been reported." The objections which Kraemer raises apply equally to the crystalline lens of fishes in which, with no evidence of a break in the capsule, hundreds of living diplostomae found an entrance into the cortical substance of the lens. When, therefore, the Director of the Museum of Natural Sciences in the City of Buffalo invited us to examine a number of rainbow trout brought from the hatchery to the aquarium, nine in ten of which had cataract, we gladly accepted the invitation in order that some of these disputed points might be studied.

Dr. Ralph Shropshire, the curator, secured over three hundred specimens including eleven varieties of our fresh-water fishes. In the eyes of all of these were found the diplostomae. In some, and frequently in large numbers, the predominating type was that of the strigiedae.

This subject is brought before this group of distinguished ophthalmologists with some hesitancy, as it cannot be considered as a preventive measure except in as much as it refers to the infestation of fishes, but von Nordmann was an ophthalmologist who, by his

scientific researches, added facts of basic importance to a collateral branch of biology. While his published reports appeared in 1832, his investigations were made in 1831, just a century ago. It seems opportune, therefore, that some recognition of his remarkable discovery should be made at this time, and secondly the implications that may be drawn from the observed facts that may be verified everywhere, seem to me of great importance to us as ophthalmologists.

The life history of the roundworm is exceedingly interesting. The eggs are laid in the intestinal tract of one of the predatory water birds, often the gull or the duck. The eggs, found in the droppings of these birds, fall in the water, which, being isotonic or slightly hypotonic, causes the shell to open. From this comes the *miracidium* (literally, "little boy"), the ciliated form of the larva which, swimming by its ciliae, finds a special variety of snail through whose soft tissues it penetrates. In the body of the snail eggs are again laid from which comes the cercarie, now wholly different in form from the miracidium. Swimming by means of its forked tail, the cercarie penetrates the body of the fish.

But the most important observation was this: Szidat, who observed the penetration of forked-tailed cercariae with pharypharumes into fish, noted that when these penetrated in too great numbers they caused the death of the fish. They entered through all the surfaces of the body but were prevented in places by the bony plates and scales. A microscopic examination showed them in all soft tissues of the body, but *six days after penetration they could not be found in the brain, blood-vessels and other organs, but only in the eyes and chiefly in the lenses.*

In the cases which we examined with the ophthalmoscope and the slit-lamp, opacities were found in many instances to be in the posterior portion of the cortex, and even with oblique illumination an undulatory motion could be discovered in the opaque patches. These patches were scattered under the posterior capsule in cloudy masses; in others the lenses were completely opacified and the fishes were blind. It was evident, in observing them in the aquaria that they had difficulty in finding their food, and in swimming about they bumped against the glass sides. On killing the fish and removing the lens, in this opacity were found small moving bodies

which, under the microscope, were discovered to be the larvae of the roundworm. The distomae (so-called because of the suckers by which it attaches itself) has an average length of about one-tenth of a millimeter. It has an undulatory motion as will be seen from the film which I shall have the pleasure of showing. These larvae were found not only in the eyes of trout but subsequent investigations showed that the eyes of almost all varieties of fresh-water fish were infected by them.

Kraemer tells us that many hundreds of human lenses have been studied and no parasites have been found in them, but it must be remembered that these almost transparent leaf-like entozoa are not easily seen and may readily escape detection—the eye must be trained to recognize them and they must be sought in regions where trematodes abound. If this is done, there is little likelihood but that many more parasitic cataracts will be added to the small group of three cases already placed on record.

To the zoologist, the life cycle of this parasite is a subject of great interest. The differentiation of the species and the small distinctions in structural formation greatly concern him. Very much attention is being given to these details which are indeed important from our viewpoint as ophthalmologists. There are also, however, certain fundamental facts which compel our attention.

First, that in the relatively vast spaces of the tiny ponds, in which the mudfish and suckers are found, as well as in the greater area of the lakes and rivers which are the homes of the stickleback, the perch and the active trout, to say nothing of the enormous expanse of the great lakes in which are found the herring and the sturgeon, the microscopic free-swimming cercariae strike for their prey with such an amazing directness that their victims, like a Saint Sebastian, punctured with innumerable arrows, are destroyed by the onslaught. In others where the infestation is not too great, after the first attack the fish appear to be unharmed, until in a comparatively short time practically all of these invaders have passed from the other organs into their ultimate goal and to that special structure in the eye which is apparently their final objective, the lens. This, of course, cannot be by chance. It has been explained as the effect of chemotaxis, which makes it almost more mysterious. What possible influence can pass from the fish to this

minute living speck that draws it as though it were in a magnetic current, through what is to it relatively a world of space, to the host that is to carry it on to its further development? It is true that the number of eggs that the fluke deposits are innumerable, but that fact in no way lessens the mystery of the influence that draws them towards their host. Even more remarkable is the force that takes them to the eye and more directly to the lens as a first resting place. Indeed, had the scheme been planned with the most exquisite finesse it could not have been more shrewdly chosen. Were one of the vital organs selected as its field of operations, such, for instance, as the heart, or the gills, or the liver, the fish would be killed and the source of supply destroyed. But the minute, almost transparent flat entozoa, having gained access into the vitreous and through the capsule and into the lens, enjoy a luxurious feeding ground for months and perhaps for years without more damage than to make turbid the rounded lens and lessen the value of sight, already one of the fishes' least important senses.

May not the fish, in this long struggle on the part of the lens against attack, have developed a certain immunizing quality? May there not be chemical elements within the fishes' lens, within the fluke, or the metacercariae, or possibly in the secretions eliminated by the parasite, that may have protective value in developing resistance to one of the commonest causes of human blindness, cataract?

To sum up, we may surmise or assume that in many cases the lenticular opacity is caused by the actual mechanical irritation of the parasite within the capsule. However, it is our belief that in addition to the injuries caused by mechanical irritation, there is, as a result of the metabolism of the flukes themselves, a substance excreted which in itself either acts directly upon the lens fibers or indirectly on the cement material which is required to keep the lens fibers in their specialized state of transparency. Consequently a number of modes of attack of this problem present themselves. To us it would be extremely interesting were it possible by micro-chemical means to determine the nature of the excretory products of these flukes, and then naturally to ascertain the effect of the introduction within the body of another animal of this material. Is this toxin a specific—in other words, does this toxin (if it be a



toxin) specifically act upon the lens tissues? Does this material which is excreted by the flukes cause any changes in the vitreous or the other fluids of the eye which might affect the nourishment of the lens; or does it cause any change in the permeability of the capsule of the lens which might likewise inhibit the proper nutrition of the lens? These are only a few of the numerous questions which obviously present themselves during the course of an investigation of this type, and are brought forth here primarily as suggestions for subjects for further research which it is our intention to continue.

We may safely leave the details of the study of the life cycle of the trematodes to the entomologists, but, as ophthalmologists, we cannot fail to be deeply interested in a subject so intimately associated with our own studies on the physiology and pathology of the human eye.

Dr. Park Lewis's lecture was followed by a film illustrating his subject.

The meeting was adjourned at 4.30 P. M.



